Solution 3 :

1°/a) $\overline{X} = \dfrac{\sum x_i}{N} = \dfrac{8}{5} = 1{,}6$.

b) $\overline{Y} = \dfrac{13+12+14+16+a}{5} = \dfrac{55+a}{5}$.

2°/ On sait que le point moyen $G(\overline{X}, \overline{Y})$ appartient à la droite $\mathcal{D}$ donc

$\overline{Y} = 9\overline{X} + 0{,}6$ or $\overline{X} = 1{,}6$ et $\overline{Y} = \dfrac{55+a}{5}$.

D'où on obtient : $\dfrac{55+a}{5} = 15$ d'où $a = 20$.

3°/ $\rho_{XY} = \dfrac{\text{cov}(X,Y)}{\sigma_X \ \sigma_Y} = \dfrac{\text{cov}(X,Y)}{\sqrt{V_X V_Y}}$

or $\text{cov}(X,Y) = \dfrac{\sum x_i y_i}{N} - \bar{x}\ \bar{y} = \dfrac{0{,}4\ a - 4{,}4}{5} = 0{,}72$

$V_X = \dfrac{\sum x_i^2}{N} - (\overline{X})^2 = 0{,}08$; $V_Y = \dfrac{\sum x_i^2}{N} - (\overline{Y})^2 = 8$

d'où $\rho_{XY} = \dfrac{0{,}72}{\sqrt{0{,}64}} = \dfrac{0{,}72}{0{,}8} = 0{,}9$.

Remarque : la corrélation est forte. car $|\rho_{XY}| > \dfrac{\sqrt{3}}{2}$

Solution 4 :

1°/ $\overline{X} = \dfrac{\sum x_i}{N} = 4$ et $V_X = \dfrac{\sum x_i^2}{N} - \overline{X}^2 = 20{,}8$